

**ELECTRONIC BY-PASS CONTROL OF GAS AROUND
THE HUMIDIFIER TO THE FUEL CELL STACK**

ABSTRACT OF THE INVENTION

A humidity control system for a fuel cell stack includes a gas supply and a humidifier including an outlet and an inlet connected to the gas supply. A fuel cell stack includes an inlet that is connected to the outlet of the humidifier. A bypass line and a valve bypass gas around the humidifier to control the humidity of gas entering the fuel cell stack. The valve is located in the bypass line, between the gas supply and the humidifier, or between the humidifier and the fuel cell stack. The valve is a gas restriction valve, a throttle valve, or a directional valve. A humidity sensor generates a humidity signal based on humidity of gas entering the fuel cell stack. A controller connected to the humidity sensor and the valve controls the valve based on the humidity signal. The inlet of the fuel cell stack is one of a cathode flow line and an anode flow line of the fuel cell stack.